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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Kazuya Maekawa

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EXAMINER

MITCHELL, JAMES M

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/509,895	Applicant(s) MAEKAWA ET AL.	
	Examiner JAMES M. MITCHELL	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-53, 55 and 56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 12-15, 19-21, 25-34, 36, 39-41, 46-50, 52, 53, 55 and 56 is/are rejected.
- 7) ☒ Claim(s) 5, 7-11, 16-18, 22-24, 35, 37, 38, 42-45 and 51 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/1/04, 1/29/08</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This office action is in response to applicant's remarks filed June 14, 2007.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on January 29, 2008 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Election

Applicant's election with traverse of Species II in the reply filed on August 10, 2006 is acknowledged. The traversal is on the ground(s) that the case is a 371 and therefore subject to a showing of lack of unity. This is found persuasive and therefore the requirement for restriction is hereby withdrawn.

Specification

Claim 56 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. There is no method in claim 28.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3, is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant

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regards as the invention. It is unclear how plate further limits "brittle material". For examination purposes the limitation the word is interpreted as mean layer.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 6 and 21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Protective material formed on the wheel and brittle material, and cutting the protective material after scribing are mutually exclusive since in order for the protective material to be on the wheel it must have performed a scribing step.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not

commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1- 4, 19, 20, 22, 23, 25-34, 36, 46-50, 52 , 53, 55 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jin et al. (U.S. 6,121,118) in combination with Siniaguine et al. (U.S. 2001/0001215), Yamamichi (JP356067933) and Hasegawa et al. (U.S. 6,461,940).

Jin (E.g. Fig. 6, 7, 12) discloses:

(cl. 1, 28) A method and apparatus for severing a brittle material substrate by inscribing (220) a scribe line (214) on a brittle material substrate(212), wherein the scribe line is formed with a scribe head comprising a cutter wheel (220) and a tip holder (holder connected to wheel not labeled; Fig. 7) that rotatably supports the cutter wheel, and wherein the method comprises a first scribing step by moving the tip holder in a horizontal direction (e.g. holder must move to form lines since wafer held on stage), thereby inscribing a scribe line (214) on the brittle material substrate;

(cl. 3, 30) the brittle material substrate is a single-plate brittle material substrate (e.g. single layer);

(cl. 4, 20, 31) further comprising a breaking step of breaking the brittle material substrate, after the scribing step (Fig. 4);

(cl. 19) brittle material with a functional layer (e.g. "circuits"; Col. 1, Lines 10-13);

(cl. 22 part) the brittle material with a function (e.g. circuit in layer; Col. 1, Lines 10-13);

(cl. 36, 50) a breaking device (320).

Jin does not appear to disclose simultaneously forming a vertical crack extending from the scribe line in a thickness direction of the brittle material substrate, pressing and rolling the cutter wheel on a protective layer/film prior to breaking, the wheel with grooves formed in a blade-edge ridge thereof or forming a protective material on at least one substrate surface of the brittle material.

Siniaguine teaches that cracks are formed in wafer upon sawing (Par. 0006).

It would have been obvious to one of ordinary skill in the art that cracks be simultaneous formed in the brittle material of Jin, since they occur during sawing as evidenced by Siniaguine (Par. 0006).

Neither Jin nor Siniaguine show its saw wheel the cutter wheel on a protective layer in a state where the protective material with a second function is on the brittle material prior to a breaking step.

However, Yamamichi (Fig. 1-2) utilizes a cutter wheel/protective material cutting device (4) on a protective layer (3; Fig. 2 & therefore use of applying device) with the function of protection in a state where the protective material is on the brittle material (1; Fig 2).

It would have been obvious to one of ordinary skill in the art to incorporate forming a protective material (therefore use of a protective material device) on the brittle material of Jin, which has a function different than the protective material, prior to breaking in order to protect the wafer from unwanted debris from scribing as taught by Yamamichi (Eng. Abstract).

Neither Jin, Siniaguine nor Yamamichi explicitly shows its saw wheel with grooves formed in a blade-edge ridge thereof that applies intermittent shocks to the brittle material.

However, Hasegawa (13B) grooves formed in a blade-edge ridge thereof.

It would have been obvious to one of ordinary skill in the art to incorporate grooves in the blade of Jin and therefore it forms intermittent shocks by cutting through brittle material in on order to reduce swarf as taught by Hasegawa (Abstract).

With respect to claim 27 examiner takes official notice that coating is well known process to form a layer and that one of ordinary skill in the art would have found it obvious to use a coating technique in order to form the protective material on the brittle substrate.

Claims 12-15, 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jin et al. (U.S. 6,121,118), Siniaguine et al. (U.S. 2001/0001215), Yamamichi (JP356067933) and Hasegawa et al. (U.S. 6,461,940) as applied to claims 1 and 28 and further in combination with Ball (U.S. 2002/0031864).

Neither Jin, Siniaguine, Yamamichi nor Hasegawa appears to disclose the brittle material substrate is a bonded brittle material substrate formed by bonding together a first substrate and a second substrate.

However, Ball teaches bonding together a first substrate and a second substrate (104,104).

It would have been obvious to one of ordinary skill in the art to incorporate bonding together a first substrate and a second substrate with the modified process of Jin in order to provide multi-chips as taught by Ball (Fig. 5).

Allowable Subject Matter

Claims 5, 7-11, 16-18, 24, 35, 37-38, 42-45 and 51 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art does not disclose or make obvious cutting protective after breaking or forming a first protective film on the protective material after scribing but before breaking or applying a second protective material different than the first on a second substrate or applying a first protective material on second substrate and peeling off before scribing the first substrate including all the limitations of the independent claim.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art discloses in: Sawada (U.S. 2002/0115235) microcracks formed in wafer due to sawing; Takeuchi et al. (U.S. 5,238,876) and Nakamura (JP02000150426) scribe moving horizontally; Glenn (U.S. 6,465,329) protective material to protect underlying circuits; Farnworth et al (U.S. 6,908,784) protective material on top and bottom surfaces of semiconductor.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES M. MITCHELL whose telephone number is (571)272-1931. The examiner can normally be reached on M-F 8:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

June 23, 2008
/James M. Mitchell/
Primary Examiner, Art Unit 2813